

1st Quarterly Status Report

Summary

The project has been started as planned and all the 1st quarter deliveries have been accomplished. Specifically, a set of model fusion-bonded epoxy (FBE) coating samples and experimental coating samples have been prepared by Tuboscope and 3M. Various existing testing protocols were evaluated and new test methods were developed. Useful testing protocols have been obtained. A newly acquired laser confocal scanning microscope (LCSM) was employed to detect the onset of coating delamination based on an established ASTM/ISO scratch testing protocol. A good correlation between the inception of the coating delamination and the corresponding evolved surface topological changes is found. Furthermore, finite element methods (FEM) modeling was carried out to establish quantitative evaluation of FBE coating adhesive strength on a steel substrate. Parametric FEM modeling is also being performed to determine the ideal coating thickness and scratch tip dimensions for effective evaluation of coating adhesive strength using the ASTM/ISO testing method. The preliminary findings are promising.